VTrans PDD Highway Safety & Design Section

Annual Report January 2014

The mission of the Highway Safety & Design Section is that of the Agency of Transportation as a whole, to provide for the safe and efficient movement of people and goods.

HIGHLIGHTS OF THE YEAR

Under Construction: The three design units within the Highway Safety & Design Section (HS&D) kept our Construction Section busy during the 2013 season.

The Roadway Program saw significant progress on the long awaited Morrisville Truck Route, the completion of the Danville Village US 2 Project, improvements to VT 73 in Sudbury and Brandon, the emergency repair of a large slope failure on VT 102 in Maidstone, replacement of a large culvert on VT 8 in Searsburg, and ledge work at Exit 8 in Montpelier.

Traffic Design delivered a new roundabout in Jeffersonville, a new signal in Essex on VT 117 at Sandhill Road, another new signal in Richmond at Exit 11, countless miles of sign replacements and line striping, and Vermont's first Adaptive Signal Control installation in Essex at VT 289 and Susie Wilson Road.

Lastly, as we've learned to expect, the Paving Program had another banner year with 287 miles of newly paved roads. This accomplishment is the result of a combination of full depth pavement reclaim projects, overlay projects, preventive maintenance surface treatments, and District Leveling.

Tropical Storm Irene - Project Identification and Planning: In a collaborative effort with the Operations Division, Environmental Unit, and Hydraulics Unit, HS&D worked diligently to identify all of the remaining Irene recovery work to be accomplished on the State Highway System. This effort resulted in the identification of 31 Tropical Storm Irene related projects for development by HS&D. The projects range from locations with a single damage site to miles-long corridor projects that include multiple sites as well as interconnecting pavement rehabilitation.

Vermont Highway Safety Alliance - Strategic Highway Safety Plan: The collaborative members of the VHSA wrote and distributed the revised Strategic Highway Safety Plan (SHSP) in 2013. Major crashes on Vermont roadways have been reduced by 10.9% since the first SHSP went into effect in 2006. The VHSA is looking to continue this trend by setting a goal of reducing major crashes by an additional 10% over the next 5 years.

Centerline Rumble Stripes: Centerline Rumble Stripes (CLRS) are a proven countermeasure for reducing the number of cross-centerline crashes on 2-lane undivided highways. In 2013, HS&D developed guidance for the installation of CLRS and implemented the practice of evaluating the need on all projects. At the start of this year's construction season there were 80 miles of CLRS on various routes across the state, and by the time that the current projects under construction are completed that number will grow to approximately 130 miles.

Flashing Yellow Arrows: Flashing Yellow Left Arrow signal indications are a new practice being used to replace the five-light "doghouse" signal heads at intersections with both protected and permitted left turns. New installations in Chittenden County and St. Albans increase driver awareness and hopefully will lead to fewer crashes related to those left turn movements.

Asset Management: In response to a safety concern with existing Weathering Steel Guardrail, HS&D's Asset Management Unit scanned the system, located and verified all installations statewide and produced an accurate inventory. Utilizing this information, a project is under development to replace the majority of this weathering steel guardrail with new galvanized w-beam guardrail. This is being done in conjunction with the Agency's current moratorium on the use of weathering steel guardrail.

VTrans Standard Drawings: 24 new T-Standards, representing the Agency's workzone standards, were implemented replacing the outdated E-Standards. The new T-Standards were developed to incorporate current

standards and practice, eliminate duplicate information already contained in the MUTCD and to provide a general formatting update.

Lighting Design Guide: A new guide for the design and installation of street lighting was completed in 2013 providing the Agency a comprehensive document for all lighting design needs.

Key Performance Indicators

PDD Quality Doctrine KPIS:
Figure A: % of projects advertised within 30 days of scheduled snapshot date. (Goal 80%)

Figure B: % of projects with PS&E estimates within 10% of low bid. (Goal 50%)

Figure C: % of projects completed on or before the original completion date. (Goal 85%)

Highway Safety & Design KPIS:
Figure D: % of projects with HS&D Quality Control review prior to QAU online shared review. (Goal 80%)

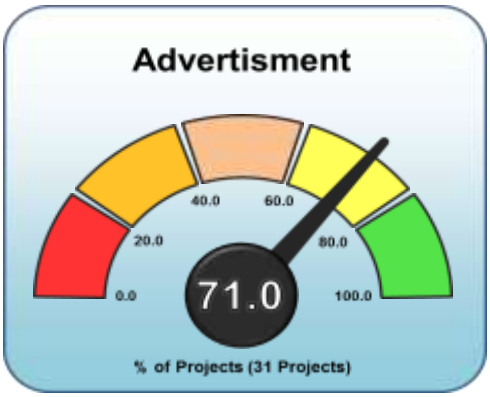

Figure A.

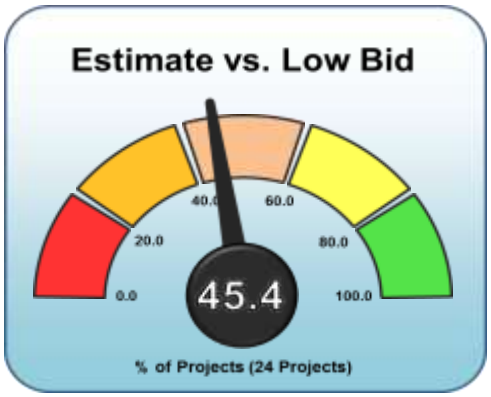

Figure B.

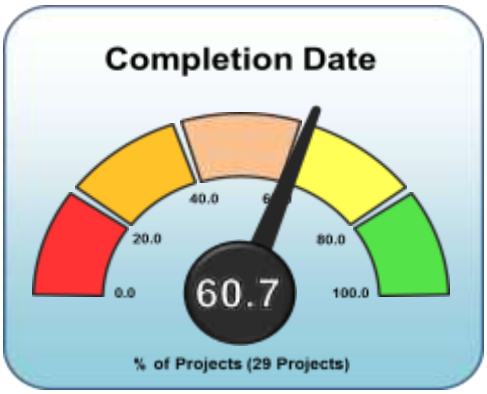

Figure C.

Figure D.

Section Management

Organization and Relocation: Highway Safety & Design, like all of PDD, experienced many changes in 2013, from where we sit, to how we operate, to how we measure success. For HS&D, the National Life renovation with the new office space philosophy triggered an analysis of how we operate. In order to design our new office arrangement and seating plan, we had to take a hard look at our management structure and how we interact as a Section. We quickly realized that this was the right time to make a long considered organizational change and craft the new space to accommodate it. The analysis resulted in the creation of a

bilateral structure that separated project development from technical development with a dedicated manager for each. Project Development, led by Jesse Devlin, is comprised of the three major design units, Roadway, Pavement and Traffic, responsible for the development and delivery of our capital improvement projects. Technical Development, led by Bruce Nyquist, is comprised of Technical Development and Quality Control, Asset Management, Traffic Operations, and Strategic Highway Safety, responsible for all the services the names of those units imply. These two halves of HS&D, though now formally separate, remain closely linked, as the work of each is integral to the success of the other. With our organizational structure in line with our physical location we've seen renewed focus on our primary responsibilities and improved communication between the various units. There is no doubt that this can only lead to better overall performance.

HS&D File Management Guidelines: In part due to multiple reorganizations and consolidation of units over the years, HS&D has not maintained a consistent file management structure that can be used throughout the Section. In an effort to maintain all files in a consistent format we developed the Highway Safety & Design File Management Guideline and have begun implementation.

HS&D Engineering Instructions: The following HS&D Engineering Instructions were put into effect throughout the year: Safety Edge Implementation; Guidelines for Milled Centerline Rumble Stripes; Workzone Safety and Mobility.

Unmet Needs

The Asset Race: Though slowly gaining ground year after year, a percentage of our assets remain in an unacceptable condition. Be it rough pavements, collapsing culverts, substandard roads, congested intersections, unstable slopes, Irene damage or areas with far too many crashes, we have a lot of work to do. Increasing our pace and gaining additional ground requires efficiency of action, staff and funding. On the Section, Division and Agency level we continue to work on ways to improve our efficiency and do more with less. We are making progress and hope our customers recognize the improvements being made.

Goals For Next Year

Corridor Management: The concept and implementation of a corridor management plan has the potential to provide many benefits to the Highway Safety & Design Section. The successful development and use of a corridor management plan may provide among other benefits; cost savings, improved public/Agency relations, improved design team ownership and pride, and more flexible, adaptable, diverse design teams. Highway Safety & Design's goal for the upcoming year is to develop strategies for improving the basic components of what will ultimately become a corridor management plan, including; communication, project schedules, staff development, asset management, quality assurance, and project flexibility.

Artemis – Capital Program Worksheets - PPMS Utilization: Artemis, Capital Program Worksheets, and PPMS are tools that are utilized by Project Managers to track and maintain schedules and budgets. Highway Safety & Design's goal for the upcoming year is to develop a procedure to ensure that all three tools are updated when a change to a project occurs, eliminating conflicting information. Project managers will be expected to maintain an accurate schedule in Artemis that does not contain procedure or scheduling errors.

Highway Safety & Design Quality Control Reviews: Highway Safety & Design quality control reviews are an important step in a project's development. These reviews are implemented to help ensure that projects produced by the Highway Safety & Design Section are consistent, accurate, and constructible. Highway Safety & Design's goal for the upcoming year is to have 80% of projects produced by the Section undergo a Highway Safety & Design quality control review in advance of undergoing an on-line shared review.

Estimating Preliminary Engineering / Construction Engineering Costs: The Highway Safety & Design Section designs and develops a wide range of projects, all with differing scopes. Estimating preliminary engineering and construction engineering costs has been inconsistent. Highway Safety & Design's goal for this upcoming year is to research past project estimates and actual costs to develop guidance for estimating these project costs, based on project scope and other project characteristics.

Lighting Design Guide: Now that the guidance document is complete, Highway Safety & Design's goals are to use the guide on all projects requiring lighting, to update the lighting standards to reflect the guide and to provide training to the Agency on the use of the guide.

Highway Safety & Design Manual: The current Road Design Manual, dated 1998, is overdue for an update. In the coming year, the Technical Development Unit of HS&D will develop a plan for the complete update of the manual and begin the preliminary tasks.

File Management Guidelines: The HS&D File Management Guidelines were developed in 2013. Our goal for 2014 is to have 100% compliance with the guidelines.

Sign Inventory Reconciliation: In 2014, the Asset Management Unit will complete the sign reconciliation effort begun in 2013. The goal of this work is to improve the accuracy of our sign inventory. Once complete, processes will be in place to utilize new sign data to validate the inventory on a reoccurring basis.

Inventory Uniformity: Management protocol and the design of new asset inventories will be critical pieces of the Asset Management strategy on an Agency-wide basis. The ability for all systems to use common data is critical. HS&D will work with others in PDD, Operations and IT to ensure that there is consistency in the design and interoperability of the asset databases.

Pavement Deterioration Model(s): Based on years of pavement performance data, deterioration models are being developed to provide predictive models for our pavement management program. Pavement deterioration models will allow Agency staff to more accurately predict the annual level of effort needed to continually meet our pavement condition performance measures.

Section Statistics

Highway Safety & Design Staff	48
Staff Changes in 2013	12
Projects Actively Managed	147
PE Authorized for New Projects	44
Tropical Storm Irene Projects under Development	31
ROW Authorized for Property Acquisition	8
Projects Advertised for Construction	39
Emergency Declaration Projects	2
Project Closeouts	126
Miles of Paving (includes District Leveling)	287
Miles of New Roadway Construction	0
Miles of Roadway Reconstruction	1